

WHAT IS CLAIMED IS:

1. An optical wavelength division multiplexing transmission system comprising:

a first optical fiber transmission path for a wavelength
5 division multiplex signal to be input therefrom;

a second optical fiber transmission path having a
zero-dispersion wavelength different from the first optical
fiber transmission path;

and an optical repeater which receives the wavelength
10 division multiplex signal from said first optical fiber
transmission path, wavelength-converts the received signal
with respect to respective wavelengths thereof, and outputs
the wavelength-converted signal to said second optical fiber
transmission path.

15

2. The optical wavelength division multiplexing
transmission system according to claim 1, wherein said optical
repeater is configured to shift, by a predetermined value,
all wavelengths of the wavelength division multiplex signal.

20

3. The optical wavelength division multiplexing
transmission system according to claim 1, wherein said optical
repeater is configured for wavelength intervals of the
wavelength division multiplex signal input from said first
25 optical fiber transmission path to be an even interval and

for wavelength intervals of the wavelength division multiplex signal output to said second optical fiber transmission path to be uneven intervals.

5 4. The optical wavelength division multiplexing transmission system according to claim 1, wherein said optical repeater is configured for wavelength intervals of the wavelength division multiplex signal input from said first optical fiber transmission path to be uneven intervals and
10 for wavelength intervals of the wavelength division multiplex signal output to said second optical fiber transmission path to be an even interval.

5. The optical wavelength division multiplexing transmission system according to claim 1, wherein said optical
15 repeater is configured for wavelength intervals of the wavelength division multiplex signal input from said first optical fiber transmission path to be a constant value $\Delta \lambda$ and for wavelength intervals of the wavelength division
20 multiplex signal output to said second optical fiber transmission path to be a constant value $\Delta \lambda'$.

6. The optical wavelength division multiplexing transmission system according to claim 1, wherein said optical
25 repeater is configured for a number of wavelengths of the

wavelength division multiplex signal input from said first
optical fiber transmission path to be a natural number n and
for a number of wavelengths of the wavelength division
multiplex signal output to said second optical fiber
5 transmission path to be a natural number m ($m \neq n$).

7. The optical wavelength division multiplexing
transmission system according to claim 1, wherein said optical
repeater comprises a non-linear element that performs the
10 wavelength conversion.

8. The optical wavelength division multiplexing
transmission system according to claim 1, wherein said optical
repeater comprises one or more semiconductor optical
15 amplifiers.

9. The optical wavelength division multiplexing
transmission system according to claim 1, wherein said optical
repeater comprises one or more electric field absorption type
20 optical modulators and one or more light sources.

10. The optical wavelength division multiplexing
transmission system according to claim 1, wherein said optical
repeater comprises one or more light sources and an optical
25 fiber having a non-linear optical effect.